SUPPORT FOR AMENDMENTS

Support for the amendments to the claims can be found in the claims as originally filed. Additional support for the amendments to Claims 6 & 12 can be found in the specification at page 6, line 23 to page 7, line 4 and Table 1. Support for the amendments to Claim 15 can be found in the specification at Tables 3 & 5. Support for newly added claims 22-29 can be found in the original claims and in the specification:

- Claim 22: original claim 6 & Table 1;
- Claims 23-25: page 6, lines 7-12; page 6, lines 14-21; page 6, line 23 to page 7, line 4; page 7, lines 6-10, respectively;
- Claim 26: page 7, lines 18-21;
- Claim 27: page 1, lines 6-11; paragraph bridging pages 11 and 12; &
- Claim 28: page 7, line 25 to page 8, line 5.

No new matter has been added.

REMARKS/ARGUMENTS

The present claims relate to alloy fin materials having minor amounts of magnesium and a relatively larger amount of manganese. There is no disclosure of such features in the references cited against the claims. Throughout the discussion given below, reference will be made to the publication of the present specification: US PGPub 2007/0113936 ("US '936").

Rejection under 35 U.S.C. § 102/103

The rejection of Claim 6 and 10-21 under 35 U.S.C. § 102(b) as anticipated by or in the alternative, under 35 U.S.C. § 103(a) as obvious over JP 2002-161323 ("Shoji") is respectfully traversed.

The Office cites alloy 14 of Shoji and alleges that this alloy contains elements encompassed by the present claims (see page 3 of the Office Action). In particular, the Office concedes that this alloy does not contain magnesium. Indeed, there is no mention of magnesium in this particular alloy. In addition, the Office considers that the phrase "0.05 wt% or less" of Claim 1 means that magnesium does not have to be present in the presently claimed alloy fin materials.

Claim 6 has been amended so that magnesium is required to be present "further having Mg as an impurity limited to at most 0.05 wt%" (see Claim 6). Thus, magnesium is present in the presently claimed alloy fin materials, unlike alloy 14 of Shoji. Moreover, the presently claimed alloy materials can have magnesium present in less than 0.02 wt% (see Claim 22). There is no disclosure of alloy fin materials having such a minor amount of magnesium in Shoji. In fact, Shoji states that magnesium must be included to improve workability properties of the alloy fin materials:

> [0019] Mg in a fin material raises the intensity of the fin material before soldering and after soldering, and it improves elevated-temperature-proof buckling nature and molding workability. The desirable content range of Mg is 0.05%-0.2%, and at less than 0.05%, the effect is small, and when contained exceeding 0.2%, there is a possibility of injuring soldering nature.[1]

On the other hand, the present claims require at most 0.05 wt% (claim 6) or less than 0.02 wt% (claim 22). The alloy fin materials of the present claims require such small amounts because too much magnesium degrades the brazing ability of the alloy:

> [0021] Mg influences the brazing ability, and induces the risk of degrading the brazing ability when the content exceeds 0.05 wt%.[2]

Thus, Shoji "teaches away" from the minimal amounts of magnesium as required by the present claims (see MPEP § 2145(X)(D)). One of ordinary skill in the art seeking to

[1] See paragraph [0019] of Shoji.
[2] See paragraph [0021] of US '936.

minimize degradation of the brazing ability of an alloy would not turn to Shoji to determine how much magnesium should be present.

It is noted that Table 4 of Shoji discloses alloy 14 which is present in fin material 16. At [0040] of Shoji, this cited reference states "since fin material 16 had too much content of Mn, hot-rolling become difficult and it was not able to manufacture a healthy material." In general, Shoji requires that the manganese is present in the alloy fin material in an amount of 1.0 to 2.0 wt%:

> The desirable content range of Mn is 1.0% - 2.0%, the effect is small at less than 1.0%, if contained exceeding 2.0%, crystallized material big and rough at the time of casting will generate, manufacture of a plate will become difficult, further, the amount of dissolution of Mn increases and thermal conductivity falls.[3]

Thus, too much manganese in the alloy fin materials yields materials that do not perform well upon use: "Since fin material No. 16 had too much content of Mn, hot-rolling became difficult and it was not able to manufacture a healthy material."[4] On the other hand, the manganese content in the present claims can exceed 2.0% and up to 3.0 wt% (see claims 6 & 22). Unlike the Shoji alloys, the presently claimed alloys can happily accommodate manganese in an amount greater that 2.0 wt% (see, *e.g.* alloys 1-6 in Table 1), and these alloys can be used to make slabs in cold-rolling processes (see claim 29). Thus, the higher amounts of manganese do not raise issues when these alloys are used in manufacturing, unlike what is disclosed in Shoji. Again, one of ordinary skill in the art would not turn to Shoji to formulate the alloys of the present claims.

In addition there is no disclosure of any crystal grain sizes in Shoji. In present claims 6 and 22, the alloy fin materials have a recrystallized grain size after brazing at 500 μm or more. It is incorrect to think that this feature would be inherent to alloy fin materials having the silicon, iron, manganese, and zinc components recited in the present claims. For

[3] See [0011] of Shoji.
[4] See [0040] of Shoji.

example, the alloy fin material of Comparative Example 18 ("CE18") is made from alloy 1, which is an alloy that is encompassed by the present claims. The CE18 alloy material has a crystal grain size of 190 μm, which is less than that of what is required of the present claims. Therefore, Applicants have demonstrated that a sample can use an inventive alloy but have a crystal grain size that is not encompassed by the limitations of the present claims. Thus, this feature is not inherent to the materials that make up the alloy materials.

For the reasons given above, one of ordinary skill in the art would not be motivated or taught by Shoji to formulate alloy materials encompassed by the limitations of the present claims. Thus, this cited reference is insufficient for maintaining any rejection of the present claims.

Accordingly, the rejection is no longer tenable and should be withdrawn.

Conclusion

Applicants respectfully submit that the above-identified application is in condition for allowance. Notification thereof is requested.

Respectfully submitted,

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